WEIL-McLAIN

MODEL EG

EG, PEG, EGH

Gas-fired Boilers — Series 4

Boiler Manual

- Installation
- Service
- Operation
- Boiler Parts

For additional information, refer to . . .

Control Supplement and Gas Control Parts

for Natural or Propane gas with optional tankless heater application



EG



EGH

Read all instructions before installing

Installer Leave all instructions with boiler for future reference.

Any claims for damage or shortage in shipment must be filed immediately against the transportation company by the consignee.

Owner Installation and service should be performed by qualified service technician.

Part No. 550-110-639/0703

Contents

Hazard definitions

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important information concerning the life of the product.

DANGER Indicates presence of hazards that will cause severe personal injury, death or substantial property damage.

WARNING Indicates presence of hazards that can cause severe personal injury, death or substantial property damage.

CAUTION Indicates presence of hazards that will or can cause minor personal injury or property damage.

NOTICE Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

WARNING The boiler contains ceramic fiber and fiberglass materials. Use care when handling these materials per instructions on page 19 of this manual. Failure to comply could result in severe personal injury.

WARNING Do not use petroleum-based cleaning or sealing compounds in boiler system. Severe damage to system components can result, causing substantial property damage.

WARNING Read all instructions before installing. Failure to follow all instructions in proper order can cause severe personal injury, death or substantial property damage.

NOTICE When calling or writing about the boiler— Please have the boiler model number from the boiler rating label and the CP number from the boiler jacket. You may list the CP number in the space provided on the **Installation and service certificate** found on page 18.

Important

EG and EGH boilers for tankless or storage heater application are available only on special order as factory-installed optional equipment. Tankless heater cannot be added to standard block assembly. Block assembly must be ordered with heater openings. Standard boilers cannot be adapted for heater use.

Installation

Codes

Installations must comply with all local codes, laws, regulations and ordinances. Also National Fuel Gas Code ANSI Z223.1-latest edition. When required, installations must conform to Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1. Safe lighting and other performance criteria were met with the gas manifold and control assembly provided on boiler when boiler underwent tests specified in ANSI Z21.13-latest edition.

Canadian installations must comply with CAN/CSA B149.1 or .2 Installation Codes. The equipment shall be installed in accordance with those installation regulations in force in the local area where the installation is to be made. These shall be carefully followed in all cases. Authorities having jurisdiction shall be consulted before installations are made.

Combustion air and ventilation openings

Combustion air and ventilation openings must comply with Section 5.3, Air for Combustion and Ventilation, of National Fuel Gas Code ANSI-Z223.1-latest edition, or applicable building codes. Canadian installations must comply with CAN/CSA B149.1 or .2 Installation Codes.

WARNING Provide adequate combustion and ventilation air to:
- Assure proper combustion
- Reduce risk or severe personal injury or death from flue gas spillage and carbon monoxide emissions.

WARNING Do not install an exhaust fan in the boiler room.

Boiler installation must assure sufficient openings in building and boiler room to provide adequate combustion air and ventilation. Consider construction tightness of building when deciding whether additional outside openings may be needed.

Older buildings with single-pane windows, minimal weatherstripping and no vapor barrier often provide enough natural infiltration and ventilation without dedicated openings.

New construction or remodeled buildings are most often built tighter. Windows and doors are weatherstripped, vapor barriers are used and openings in walls are caulked. As a result, such tight construction is unlikely to allow proper natural air infiltration and ventilation.

Air from inside building (boiler in interior room):

- Tightly constructed buildings must be provided with openings to outside for combustion and ventilation air. These openings must be sized to handle all fuel burning appliances, exhaust and ventilation fans and fireplaces.
- When openings to boiler room are taken to interior spaces, provide two permanent openings: a combustion air opening within 12 inches of floor and a ventilation opening within 12 inches of ceiling. Each opening must provide a minimum free area of one square inch per 1,000 Btuh input of all appliances in room plus requirements for any exhaust fans in room. The interior space supplying combustion and ventilation air must have adequate infiltration from outside.

Air directly from outside to boiler room:

- Tightly constructed buildings must be provided with combustion air and ventilation openings to boiler room which are adequate to handle the boiler needs plus the needs of all other fuel-burning appliances, fireplaces and exhaust or ventilation fans.
- Combustion and ventilation openings connecting directly or by ducting to outside, or to attic or crawl spaces that freely connect with outside, must be sized as follows:
  1. Outside wall or vertical ducting - one square inch per 4,000 Btuh input of all appliances in room plus requirements for any exhaust fans or other appliances in room.
  2. Horizontal ducting - one square inch per 2,000 Btuh of all appliances in room plus requirements for any exhaust fans or other appliances in room.
  3. All ducting must be same size as permanent openings. Minimum area dimensions of ducting must be no less than 9 square inches.
  4. Other size ducting must comply with local codes.

Installation *(continued)*

Chimney or vent requirements

(also refer to Breaching erection, Page 8)

Venting must be installed according to Part 7, Venting of Equipment, of National Fuel Gas Code ANSI Z223.1-latest edition and applicable building codes. Canadian installations must comply with CAN/CSA B149.1 or .2 Installation Codes.

Minimum chimney or vent sizes are on page 27 of these instructions. A chimney or vent without a listed cap should extend at least 3 feet above the highest point where it passes through a roof of a building and at least 2 feet higher than any portion of a building within a horizontal distance of 10 feet. A chimney or vent must not extend less than those distances stated above.

A lined chimney is preferred and must be used when required by federal, provincial, territorial, state, or local building codes. Vitreous tile linings with joints that prevent retention of moisture and linings made of noncorrosive materials are best. Advice for flue connections and chimney linings can be obtained from local gas utility. Type "B" double wall metal vent pipe or single wall vent pipe may be used as a liner.

Cold masonry chimneys, also known as outside chimneys, typically have one or more walls exposed to outside air.

When any atmospheric gas-fired boiler with automatic vent damper is vented through this type of chimney, the potential exists for condensation to occur. Condensation can damage a masonry chimney.

Weil-McLain recommends the following to prevent possible damage:

1. Line chimney with corrosion-resistant metal liner such as AL29-4C® single wall stainless steel or B-vent. Size liner per National Fuel Gas Code ANSI Z223.1-latest edition.
2. Provide drain trap to remove any condensate.

DANGER Inspect existing chimney or vent before installing boiler. Failure to clean or replace perforated pipe or tile lining will cause severe injury or death.

DANGER Do not alter boiler draft hood or place any obstruction or non-approved damper in the breeching of vent system. CSA certification becomes void. Flue gas spillage and carbon monoxide emissions will occur causing severe personal injury or death.

Where two or more gas appliances vent into a common chimney or vent, equivalent area should be at least equal to the area of the vent outlet on the largest appliance plus 50 percent of the area of the vent outlet on the additional appliance.

When removing boiler from common venting system

CAUTION Failure to follow all instructions listed below can cause flue gas spillage and carbon monoxide emissions, resulting in severe personal injury, death or substantial property damage.

At the time of removal of an existing boiler, the following steps shall be followed with each appliance remaining connected to the common venting system placed in operation, while the other appliances remaining connected to the common venting system are not in operation.

a. Seal any unused openings in the common venting system.
b. Visually inspect the venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
c. Insofar as is practical, close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliance not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
d. Place in operation the appliance being inspected. Follow the lighting instructions. Adjust thermostat so appliance will operate continuously.
e. Test for spillage at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle, or smoke from a cigarette, cigar or pipe.
f. After it has been determined that each appliance remaining connected to the common venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers, and any other gas-burning appliance to their previous conditions of use.
g. Any improper operation of the common venting system should be corrected so the installation conforms with the National Fuel Gas Code, ANSI Z223.1-latest edition. When resizing any portion of the common venting system, the common venting system should be resized to approach the minimum size as determined using the appropriate tables in Part 11 in the National Fuel Gas Code, ANSI Z223.1-latest edition.

Canadian installations must comply with CAN/CSA B149.1 or .2 Installation Code.

Select the boiler location

- Consider all connections to boiler before selecting a location.
- Boiler must be installed so gas control system components are protected from dipping or spraying water or rain during operation or service.
- Non-combustible floor ONLY. See "Boiler foundation", Page 5.

WARNING To avoid personal injury, death or property damage, keep boiler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

Installation *(continued)*

Installation clearances

Suggested minimum clearances for servicing

- 24 inches for cleaning and servicing, left side.
- 18 inches for access to controls and components, front.
- 46 inches from top for cleaning flueways.
- 6 inches on remaining sides.

Required minimum clearances to combustible material in alcove installations

Top 46"	R. Side 4"	Front: Alcove
Rear 6"	L. Side 4"	

EGH 105-125: Provide service clearances listed above and minimum 24" between jacket and any combustible wall(s) and ceiling. Install in space large in comparison to size of boiler.

- Single wall vent pipe must be at least 6 inches from combustible material.
- Type "B" double wall metal vent pipe - refer to vent manufacturer's recommendation for clearances to combustible material.
- Hot water pipes must be at least ½" from combustible material.

Residential garage installation

Install boiler so burners are at least 18 inches above the floor.

Boiler foundation

WARNING Never install boiler on combustible flooring or carpeting, even if a concrete or aerated foundation is used. Severe personal injury, death or substantial property damage can result.

1. See Figure 1. A level concrete or solid brick pad is required if:
   a) There is a possibility of the floor becoming flooded.
   b) Non-level conditions exist.
2. An aerated boiler foundation is recommended if any of the following conditions exist:
   a) Electrical wiring or telephone cables buried in the concrete floor of the boiler room.
   b) Concrete floor is "green."
   c) There is a history of the floor becoming flooded.
   d) Water is channeled under the concrete.

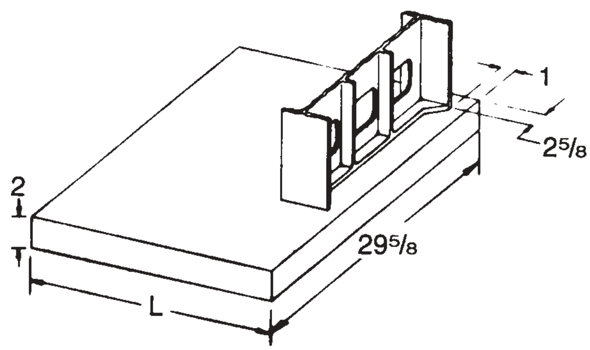
Placing the boiler

WARNING Block assembly is extremely heavy. Handle with caution to avoid personal injury.

Where the EGH block assembly is taken apart for handling:

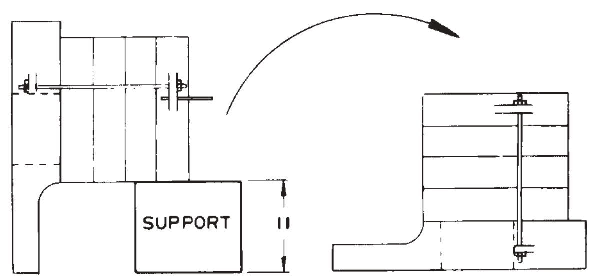
1. Put a support under center of block. Support must be within 1/2 inch of block bottom.
2. Remove short center draw rods.
3. Tip half blocks on end as shown in Figure 2. Save elastomer sealing rings and cope seal between sections.

Figure 1 Boiler foundation



Boiler Foundation Size - Inches			
Boiler No.	"L"	Boiler No.	"L"
EG 30-35	19	EGH 85	40 ¼
EG 40-45	23 ¼	EGH 95	44 ½
EG 50-55	27 ½	EGH 105	48 ¾
EG 65	31 ¾	EGH 115	53
EG 75	36	EGH 125	57 ¼

Figure 2



4. After moving half-blocks into desired location, clean port surfaces with clean, dry rag. Do not use oil. Place sealing rings in recessed ports. Place cope seal in section grooves.
5. Re-assemble block in reverse order. When drawing sections together, use 45 (± 5) ft-lbs torque.

Installation of optional indirect water heater

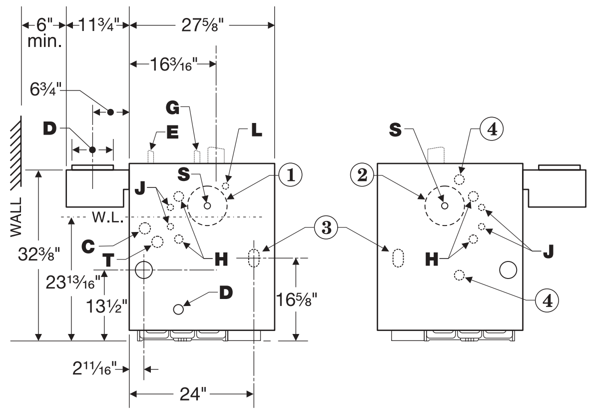
For a boiler ordered with internal type indirect water heater, remove heater opening cover plate (water boilers - round plate on left side; steam boilers - rectangular plate on front).

Install heater(s) as shown on pages 13. Do not over tighten studs and nuts - damage to the gasket can occur..

Installation *(continued)*

Figure 3

Tapping	Size Inches	Steam Boilers	Water Boilers
C	¾	Probe type low water cut-off	Probe type LWCO (when used)
D	¾	Drain	Drain
E	¾	Safety valve	Safety relief valve
G	¾	Plugged	Piping to compression tank or auto air vent
H	½	Guage glass and/or optional low water cut-off	Combination pressure temperature guage
J	⅜	Tri cock tappings	Plugged on (Float type LWCO)
L	½	Syphon, pressure gauge, high limit (Probe type LWCO)	Combination pressure temperature guage
P (EGH Only)	1	Float type low water cut-off, pressure limit control and pressure guage; or low water cut-off and feeder combination; or low water cut-off and pump control	Float type low water cut-off; or low water cut-off and feeder combination; or low water cut-off and pump control
S	1 ½	Skim tapping	Limit control
	¾ (note 1)	—	Limit control
T	—	Backup LWCO probe	Backup LWCO probe
Notes:	1. Available on special request only, when tankless heater is specified. 2. Limit control and supply piping must be on the same end of the EGH boiler 3. When an internal type water heater is installed, use the tapping in the heater for an additional operating control.		



① Optional heater for water boiler

② Optional heater for water boiler — available only on EGH boilers

③ Gas supply entrance — enter on either side of boiler

④ Tapping "**P**" — available only on EGH boilers

Hydrostatic pressure test

Pressure test before attaching gas piping or electrical supply.

1. Plug any necessary boiler tappings or openings.
2. Do not use gauge supplied with boiler for pressure testing. Install gauge with appropriate range.
3. Fill boiler with water. Vent all air. Test steam boilers between 45 - 55 psi and water boilers at 1-1/2 times working pressure.

WARNING Do not leave boiler unattended. A cold water fill could expand and cause excessive pressure, resulting in severe personal injury, death or substantial property damage.

4. Check for maintained gauge pressure and leaks. Repair if found.

WARNING Leaks must be repaired at once. Failure to do so can cause boiler damage, resulting in substantial property damage.

DANGER Do not use petroleum-based sealing compounds in boiler system. Severe damage to boiler will result, causing substantial property damage.

5. Drain boiler and repair leaks if found.
6. Retest boiler after repairing leaks.
7. Remove plugs from any tappings that will be used for controls and accessories. Refer to control tapping table and Figure 3.
8. On initial start-up check for leaks in the system piping. If found, repair at once.

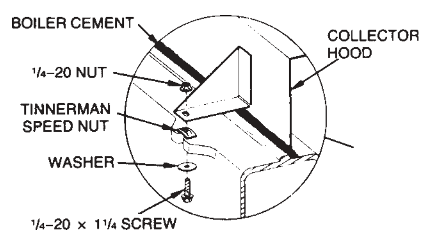
Installation of flue collector hood

(Factory installed on PEG boilers)

Set flue collector hood on boiler as shown in Figure 4. Use boiler cement furnished to provide gas-tight seal.

WARNING Failure to maintain gas-tight seal can cause flue gas spillage and carbon monoxide emissions, resulting in severe personal injury or death.

Figure 4 Flue collector hood



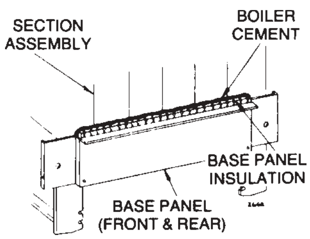
Installation of front and back base panels (Factory installed on PEG boilers)

See Figure 5 for installation. Fasten front (6 1/8 inch) and back 7 5/16 inch) base panels to sections. Seal with boiler cement along top of insulation panels.

WARNING Failure to maintain gas-tight seal can cause flue gas spillage and carbon monoxide emissions, resulting in severe personal injury or death.

Installation *(continued)*

Figure 5 Front and back base panels



Installation of drawer assembly and front access panel and back base channel (Factory installed on PEG boilers - follow steps 2 and 3)

1. The drawer assembly consists of the burner drawer, main burners, gas manifold, pilot burner, etc. See Figures 6, 7 and 8 for installation.
2. Check for proper orifice sizing from chart below.

DANGER Proper orifices must be used. Failure to do so will cause severe personal injury, death or substantial property damage.

3. Level and straighten burners.

DANGER Burners must be properly seated in slots in back burner support with openings facing up. Gas orifices must inject down center of burner. Failure to properly seat burners will result in severe personal injury, death or substantial property damage.

4. Install front access panel and back base channel. See Figure 9.
5. Install rollout thermal fuse element with wire terminals facing up on front access panel of EG 30-75 boilers only as shown in Figure 9. Wire per Control Supplement.

Orifice Drill Sizes		
Type of gas	**Heating value BTU/cu. ft.**	**Standard orifice drill size**
Natural	1,000	2.45 mm
Propane	2,500	1.55 mm

Orifice Drill Sizes - EG - Canada Only		
Elevation	**Natural**	**Propane**
0 - 2,000 ft.	2.45 mm	1.55 mm
2,000 - 4,500 ft.	2.30 mm	1.45 mm

Figure 6 Burner drawer assembly

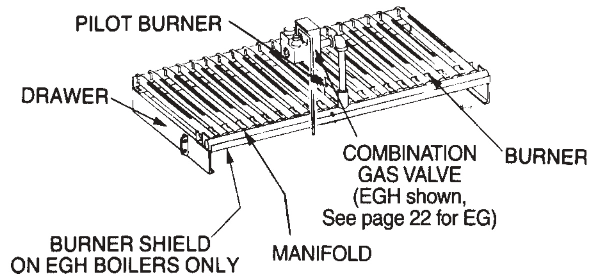


Figure 7 Pilot burner location

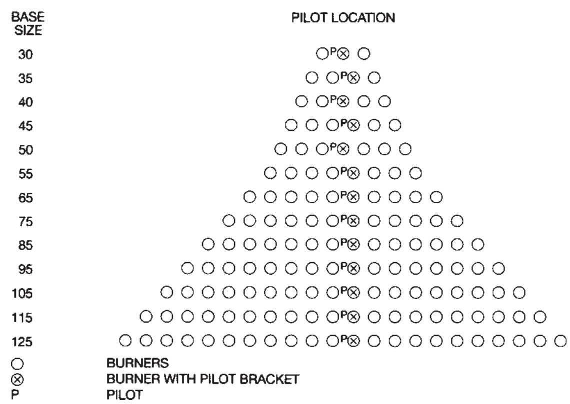


Figure 8 Burner drawer installation

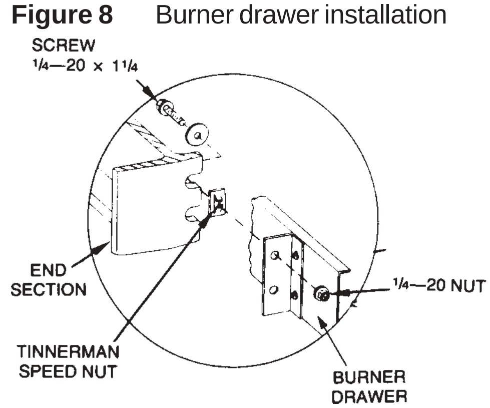
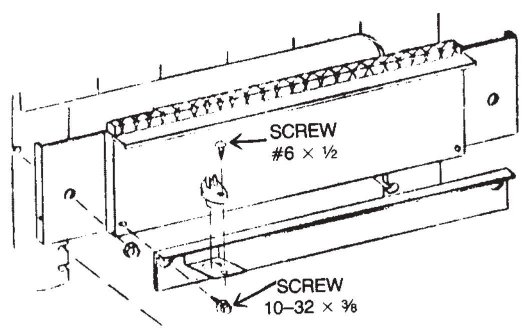


Figure 9 Access panel



Installation *(continued)*

Jacket installation (Factory installed on PEG boilers)

1. Remove the proper knockout discs from panels as shown in tapping table, page 6.

NOTICE Tankless and storage heater knockouts must be removed for EG and EGH boilers with optional tankless heaters prior to jacket installation.

2. Follow Jacket Instructions in jacket carton.

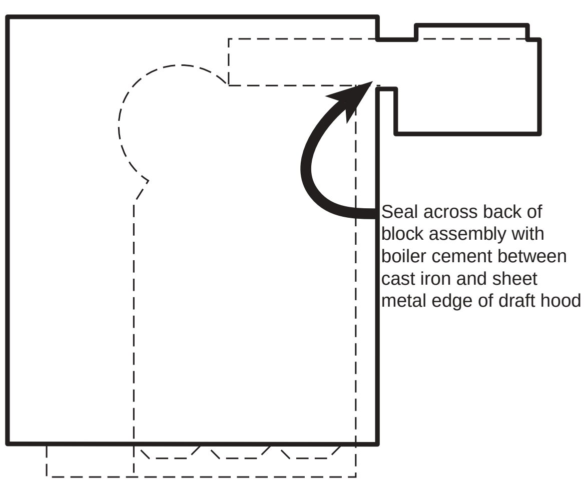
Draft hood installation

Attach draft hood to flue collector hood using #10 x 1/2" sheet metal screws provided. Use boiler cement furnished to provide gas tight seal.

WARNING Failure to maintain gas-tight seal can cause flue gas spillage and carbon monoxide emissions, resulting in severe personal injury or death.

DANGER Do not alter boiler draft hood or place any obstruction or non-approved damper in the breeching or vent system. A.G.A. and C.S.A. certifications will become void. Flue gas spillage and carbon monoxide emissions will occur causing severe personal injury or death.

Figure 10 Draft hood



Spill switch installation

On EG 30-75 boilers only, fasten spill switch to draft hood as shown on page 22, Drawing Ref. Letter “K”. Connect wires as shown in Control Supplement.

Damper installation

If damper will be installed, see Control Supplement for information.

Breeching erection

Connect from draft hood or damper outlet to chimney or vent with same size breeching. Where possible, vertical venting to the outside from draft hood or damper outlet will offer best performance. Where horizontal breeching is used, slope upward at least 1/4 inch per lineal foot toward chimney or vent and support with hangers to prevent sagging.

WARNING A vertical height of 3 feet to 5 feet of breeching before any elbow or horizontal breeching is recommended to reduce chances of flue gas spillage at draft hood on EGH-95 thru -125 boilers (not restricted on any EG or EGH-85). Long horizontal breechings, excessive numbers of elbows or tees, or other obstructions which restrict the flow of combustion gases should be avoided.

Breeching must not be connected to any portion of a mechanical draft system operating under positive pressure.

Piping connections

Pipe before installing controls. Connect return piping after jacket is attached. Connect supply piping before or after jacket is attached.

CAUTION Failure to properly pipe the boiler may result in improper operation and damage to the boiler or building.

Forced hot water boilers and gravity hot water boilers (EG Only)

1. To protect:
   - radiant panels, plaster, etc. from high temperature water supplied from boiler, or
   - boiler from condensation caused by low temperature water returned from system.
2. To protect boiler from condensation formed by low water temperature returned from large water content converted gravity systems, etc., see Figure 4, page 6.

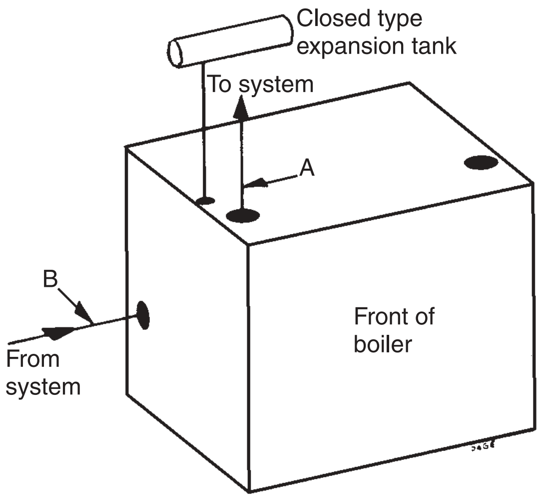
Refer to tables and Figures 11a and 11b.

1. Circulator must be selected and sized according to the design requirements of the system. Size expansion tank to handle the volume of water in the system.
2. Small expansion tanks cause system water to be lost from relief valve. Make-up water is then added through fill valve. Eventual section failure can result. Expansion tank installation:
   a) Closed type expansion tank - connect from the 3/4" N.P.T. tapping on left end section to expansion tank using 3/4" N.P.T. piping. Any horizontal piping must pitch upward toward tank at least 1 inch per 5 feet of piping.
   b) Diaphragm type expansion tank - may be located anywhere in the system, preferably near the boiler. Install automatic air vent as shown in Figure 11b.
3. Install water relief valve vertically in "E" tapping.

WARNING Relief valve discharge piping must be piped near floor close to floor drain to eliminate potential of severe burns. Do not pipe to any area where freezing could occur. Do not plug, valve or place any obstruction in discharge line.

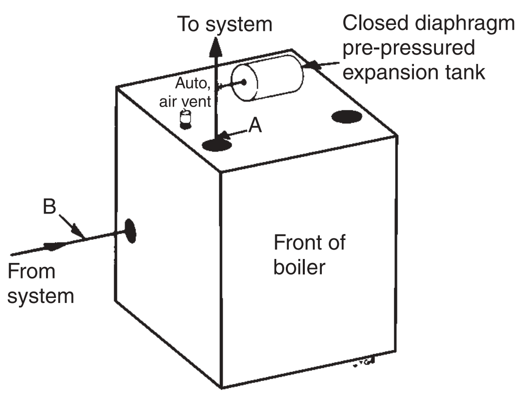
4. Connect system return piping to left end for EG - right or left for EGH. Supply and return must be on same end of EGH boiler, for proper flow and disposition of water throughout the sections.
5. Installer must provide drain cock(s).
6. Connect cold water fill supply piping close to boiler.
7. Plug all unused tappings.

Figure 11a Recommended piping connections forced hot water boilers with closed type expansion tanks



Gravity Hot Water Minimum Recommended Pipe Sizes		
Boiler Number	**Supply**	**Return**
EG-30, 35	1 ½"	1 ½"
EG-40, 45, 50	2"	2"
EG-55, 65, 75	2 ½"	2 ½"

Figure 11b Recommended piping connections forced hot water boilers with diaphragm type expansion tanks



*Forced Hot Water Minimum Recommended Pipe Sizes		
Boiler Number	**Supply "A"**	**Return "B"**
EG-30, 35	1"	1"
EG-40, 45, 50	1 ¼"	1 ¼"
EG-55, 65	1 ½"	1 ½"
EG-75	2"	2"
EGH-85–95	2"	2"
EGH-105–125	2 ½"	2 ½"
Note:	* All supply and return pipe sizes are based upon a 20°F temperature rise through the boiler	

Piping connections *(continued)*

8. Multiple Zoning
   a) Zone valves:
      Refer to zone valve manufacturer's literature for wiring and application. A separate transformer is required to power zone valves.
      Provide balancing valves to adjust the flow so it is about the same in each zone.
   b) Circulators:
      Zoning with circulators requires a relay for each circulator. Install flow control valves to prevent gravity circulation. Provide balancing valves to adjust the flow so it is about the same in each zone.
9. If system is to be ASME inspected and approved, an additional high temperature limit is needed. Purchase and install the control in supply outlet piping from boiler.

Bypass piping

BYPASS PIPING IS NOT NORMALLY REQUIRED ON ANY BASEBOARD SYSTEM

Bypass piping should be used for the following installations. Bypass, supply, and return piping should be same size.

1. See Figure 12 to protect:
   - radiant panels, plaster, etc. from high temperature water supplied from boiler, or
   - boiler from condensation caused by low temperature water returned from system.
2. See Figure 13 to protect boiler from condensation formed by low water temperature returned from large water content converted gravity systems, etc.

Use with refrigeration systems

The boiler must be installed so that chilled medium is piped in parallel with the heating boiler with appropriate valves to prevent the chilled medium from entering the boiler. See Figure 14. Consult I=B=R Installation and Piping Guides.

If boiler is connected to heating coils located in air handling units where they can be exposed to refrigerated air, gravity circulation during the cooling cycle must be prevented with flow control valves or other automatic means.

Figure 12

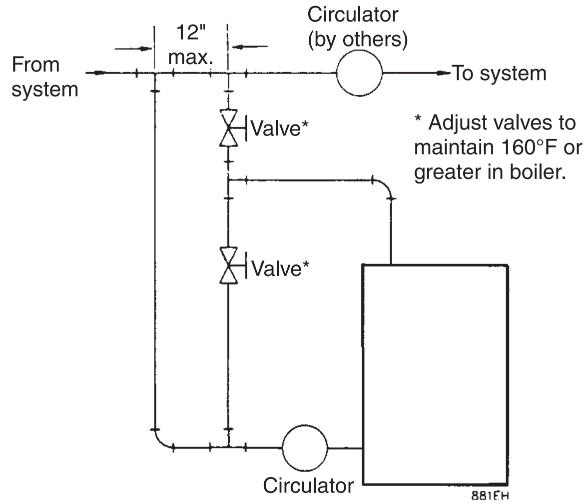
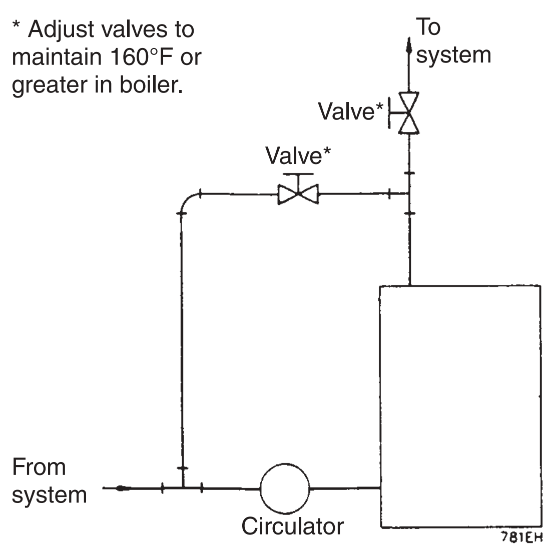


Figure 13



Piping connections *(continued)*

Steam boilers

1. Refer to table and Figures 14 or 15. Pipe exactly as shown. Satisfactory operation of a steam heating system depends on adequate condensate return to boiler to maintain a steady water level. Avoid adding raw make-up water. Where condensate return is not adequate, install low water cut-off and pump control, condensate receiver, and condensate boiler feed pump. Refer to Figure 16 for sizing.
2. Install steam relief valve vertically in "E" tapping.

WARNING Relief valve discharge piping must be piped near floor close to floor drain to eliminate potential or severe burns. Do not pipe to any area where freezing could occur. Do not plug, valve or place any obstruction in discharge line.

3. EGH only - install 3/4" system blow-off (drain) valve in lowest part of return piping close to boiler.

Figure 14 Recommended piping connections EG steam boilers

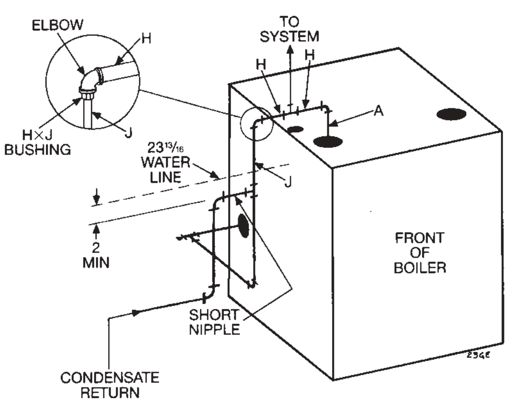
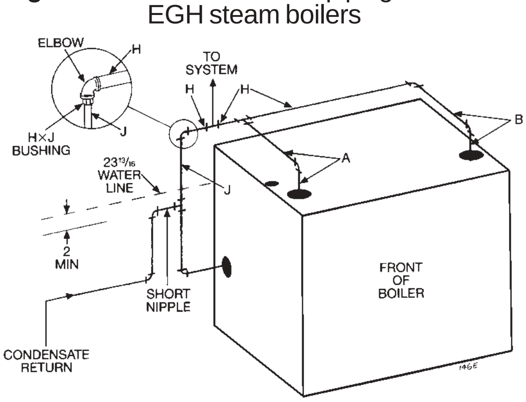


Figure 15 Recommended piping connections EGH steam boilers



Steam Boiler Piping Minimum Recommended Pipe Sizes				
Steam Boiler Size	Riser Pipe Size		Header* H	Equalizer J
	A	B		
EG-30, 35	2"	–	2"	1 ½"
EG-40, 45, 50	2 ½"	–	2 ½"	1 ½"
	2"	2"	2"	1 ½"
EG-55, 65, 75	3"	–	3"	1 ½"
EGH-85, 95	2"	2"	3"	1 ½"
EGH-105	2 ½"	2 ½"	3"	1 ½"
EGH-115, 125	2 ½"	2 ½"	4"	1 ½"
Note*:	24" minimum from waterline to header.			

Figure 16 Condensate receiver capacity

Boiler Model Number	Gross Output **Steam**	**Condensate**	**Minimum Condensate Receiver Capacity** (gallons) Select minimum receiver capacity based on time **(minutes)**, required for condensate to return to the receiver.				Recommended **Feed Pump Capacity**
	lbs/hour	gallons/hour	**15** min	**30** min	**45** min	**60** min	GPM
EG-30	63.0	8	**2**	**4**	**6**	**8**	0.2
EG-35	81.0	10	**3**	**6**	**9**	**12**	0.3
EG-40	102.0	12	**4**	**7**	**11**	**14**	0.4
EG-45	122.0	15	**5**	**9**	**14**	**18**	0.5
EG-50	142.0	17	**5**	**10**	**15**	**20**	0.6
EG-55	163.0	20	**6**	**12**	**18**	**24**	0.7
EG-65	203.0	24	**7**	**14**	**22**	**29**	0.8
EG-75	240.0	29	**9**	**17**	**26**	**35**	1.0
EGH-85	280.0	34	**10**	**20**	**31**	**41**	1.1
EGH-95	320.0	38	**11**	**23**	**34**	**46**	1.3
EGH-105	360.0	43	**13**	**26**	**39**	**52**	1.4
EGH-115	400.0	48	**14**	**29**	**43**	**58**	1.6
EGH-125	440.0	53	**16**	**32**	**48**	**64**	1.8

NOTE : Steam supply must be on same end as controls. Return may be from either end.

Install boiler controls

WARNING Failure to properly install, pipe and wire boiler controls may result in severe damage to the boiler, building and personnel.

Water boiler

1. Install controls as shown on Control Tapping Table and Figure 3, page 6. Limit control and supply piping must be on the same end of EGH boiler.
2. Low water cut off for water boilers:
   a) Must be installed if boiler is located above radiation level.
   b) Must be installed on all EGH 105-125 water boilers to meet ASME specifications (low water cut-off not supplied by Weil-McLain).
   c) May be required on water boilers by certain state, local or territorial codes or insurance companies. If a low water cut-off is used on a water boiler, use a control designed especially for water installations. An electrode probe type may be located in a tee in the supply line above boiler, also see Control Tapping Table, page 6.
3. If system is to be ASME inspected and approved, an additional high temperature limit is needed. Purchase and install in supply line above boiler.

Steam boiler

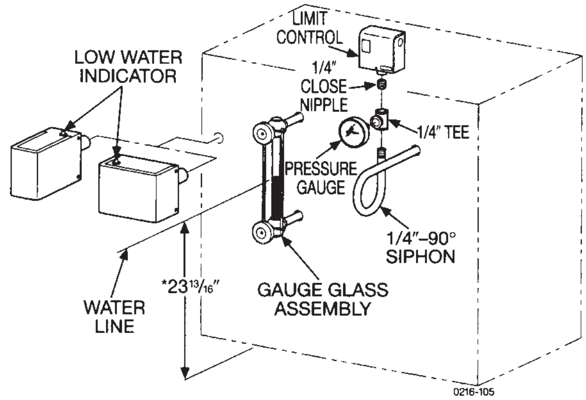
1. For steam boilers furnished with probe-type low water cut-offs, install as shown in Figure 17.
2. For steam boilers furnished with float type low water cut-off, install controls as illustrated in Figure 18.

   Install blowdown line in bottom of cutoff. See Figure 19 and control manufacturer's instructions for details.

WARNING Pipe blowdown line near floor close to floor drain to eliminate potential of severe burns. Do not plug, valve or place any obstruction in blowdown line.

   a) Other float-type water-level controls for EGH steam boilers are shown in Figure 19. (Use 1 inch I.P.S. connections).
   b) Water feeders are not recommended for primary control. A low-water cut-off with pump controller is recommended with a condensate receiver and feed pump.
3. Install remaining controls as shown in Control Tapping Table and Figure 3, page 6.

Figure 17 Probe-type low water cut-off



NOTE: Water line dimension measured from bottom of boiler section leg where it rests on the boiler room floor or boiler foundation.

Figure 18 Float-type low water cut-off

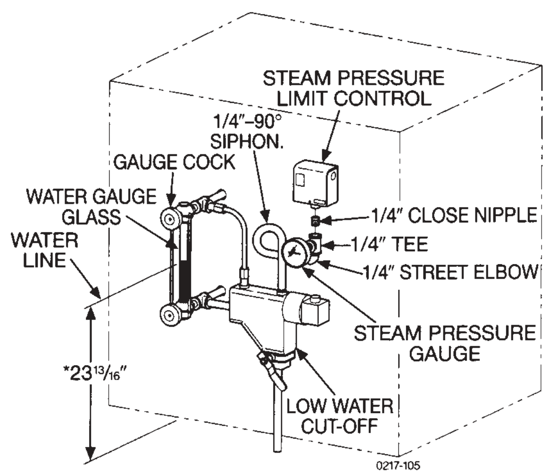
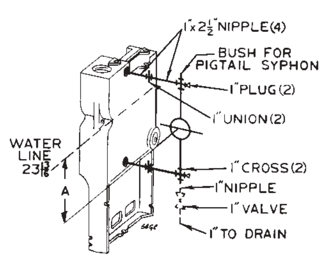


Figure 19 Piping for optional float-type water level controllers for steam boilers



L.W.C.O.	Dim A.
No. 247-2	1 3⁄16"
No. 61	2 5⁄8"
No. 63	2 5⁄8"
No. 51-2, 51 -S-2	1 ½"
No. 150, 157	2 ¼"
No. 93, 94	2 5⁄8"

Optional heaters

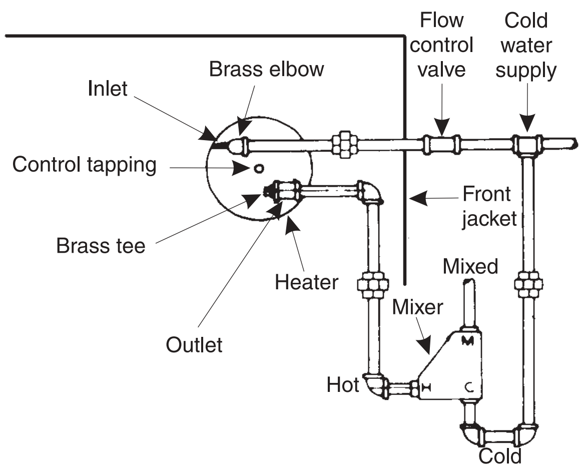
NOTICE EG and EGH boilers for tankless heater application are available only on special order as factory-installed optional equipment. Standard boilers cannot be adapted for heater use.

Tankless heater hook-up (forced hot water or steam boilers)

For correct operation, install as shown in Figure 20 (water boilers) or Figure 21 (steam boilers).

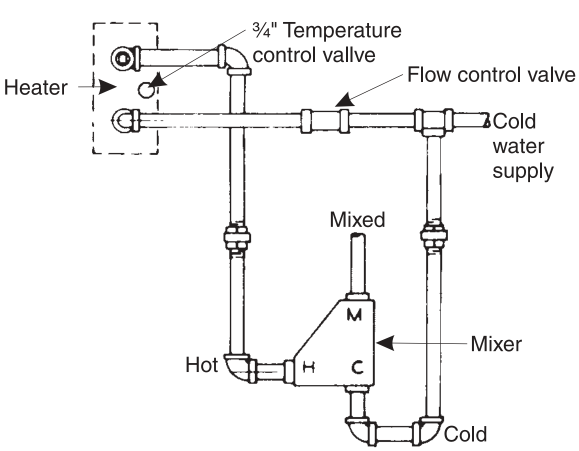
1. Automatic mixing valve must be installed per mixing valve manufacturer's instructions.
2. Flow regulating valve must be installed. Size according to intermittent draw of heater as shown in following table.
3. Operating control with a small differential scale is recommended. Install in temperature control tapping in heater plate.
4. In hard water areas, it is advisable to soften cold domestic supply water to the tankless heater to prevent lime buildup.

Figure 20 Tankless heater piping (water boiler)



NOTE: Piping Connections not furnished. Use brass plugs in tees and crosses to facilitate cleaning in hard water areas.

Figure 21 Tankless heater piping (steam boiler)



Steam and Forced Hot Water Boiler Tankless Heater Ratings

Boiler Number	Heating Number (Note 3)	Intermittent Draw GPM 100°F Av. Temp. Rise (Note 1)	Continuous Draw GPM 100°F Av. Temp. Rise (Note 2)	Inlet and Outlet Tappings	Temp. Control Tapping
Water					
EG-35	E-624	3.00	1.60	½"	¾"
EG-40	E-624	3.00	2.00	½"	¾"
EG-45	E-624	3.25	2.40	½"	¾"
EG-50	E-626	4.00	2.80	½"	¾"
EG-55	E-626	4.25	3.20	½"	¾"
EG-65 (Note 4)	E-632	4.50	4.00	½"	¾"
EG-75 (Note 5)	E-632	4.50	4.80	½"	¾"
EGH-85 (Notes 4 & 6)	E-632	5.50	5.60	½"	¾"
EGH-95 (Note 4)	E-632	5.50	5.55	½"	¾"
EGH-105	E-632	5.75	5.75	½"	¾"
EGH-115	E-632	6.00	6.00	½"	¾"
EGH-125	E-632	6.00	6.00	½"	¾"
Steam					
EG-35	35-S-29	3.00	1.60	¾"	¾"
EG-40	35-S-29	3.00	2.00	¾"	¾"
EG-45	35-S-29	3.25	2.40	¾"	¾"
EG-50	35-S-29	3.25	2.80	¾"	¾"
EG-55	35-S-29	3.50	3.20	¾"	¾"
EG-65	35-S-29	3.75	4.00	¾"	¾"
EG-75	35-S-29	4.00	4.80	¾"	¾"
EGH-85	35-S-29	4.00	5.00	¾"	¾"
EGH-95	35-S-29	4.00	5.00	¾"	¾"
EGH-105	35-S-29	4.00	5.00	¾"	¾"
EGH-115	35-S-29	4.00	5.00	¾"	¾"
EGH-125	35-S-29	4.00	5.00	¾"	¾"

Notes Weil-McLain ratings based on 60 PSIG domestic water pressure at heater.

1. Gallons of water per minute heated from 40°F to 140°F with 200°F boiler water temperature.
2. Continuous draw – no recovery period.
3. These single wall heat exchangers comply with National Standard Plumbing Code provided that:
   - boiler water (including additives is pratically non toxic, having a toxicity range or class of 1, as listed in Clinical Toxicology of Commercial Products, and
   - boiler water pressure is limited to max. 30 psig by approved water or steam relief valve.
4. EGH-85 & 95 Standing pilot systems - no tankless option
5. EG-75 Standing pilot systems - no tankless option
6. EGH-85 Water - use one heater only.

Gas piping

Connecting gas supply piping

Size gas piping considering:

a. Diameter and length of gas supplying piping.
b. Number of fittings.
c. Maximum gas consumption (including any possible future expansion).
d. Allowable loss in gas pressure from gas meter outlet to boiler. For pressure drops, see ANSI Z223.1. Canadian installations must comply with CAN/CSA B149.1 or .2 Installation Codes.

1. For natural gas:
   a) Refer to following tables. To obtain cubic feet per hour, divide the input by 1000.
   b) Size for rated boiler input.
   c) Inlet gas pressure: 5" W.C. minimum, 13" W.C. maximum
   d) Manifold gas pressure: 3½" W.C.
   e) Install 100% lock-up gas pressure regulator in supply line if inlet pressure exceeds 13" W.C. Adjust for 13" W.C. maximum.
2. For propane gas:
   a) Inlet gas pressure: 11" W.C. minimum, 13" W.C. maximum
   b) Manifold gas pressure: 10" WC.
   c) Gas pressure regulator provided by gas supplier must be adjusted for maximum pressure of 13" W.C.
   d) Contact gas supplier to size pipes, tanks and regulator.

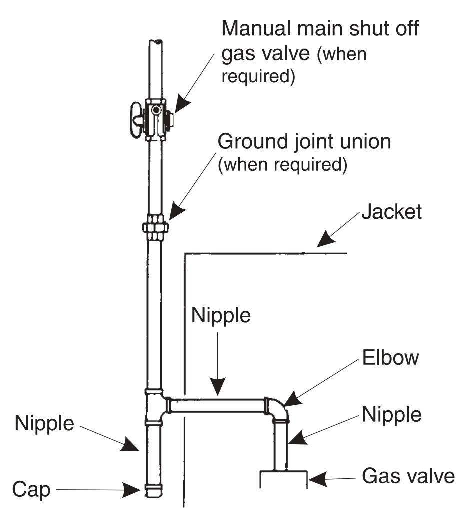
Pipe Delivery Scedule Table						
*Adjusted length of gas supply piping in feet	**Capacity of pipe sizes in cubic feet of gas per hour					
	½"	¾"	1"	1 ¼"	1 ½"	2"
10	132	278	520	1,050	1,600	3,050
20	92	190	350	730	1,100	2,100
30	73	152	285	590	890	1,650
40	63	130	245	500	760	1,450
50	56	115	215	440	670	1,270
75	45	93	175	360	545	1,020
100	38	79	150	305	460	870
150	31	64	120	250	380	710
Note:	* Include measured length of gas supply piping and allowance in feet for number and size of fittings. ** Specific Gravity - 0.60; Pressure Loss - 0.30" w.c.					

3. Remove knock-out disc from jacket panel which gas supply is to be piped.
4. Follow good piping practices.
5. Pipe joint compound (pipe dope) must be resistant to corrosive action of liquified petroleum gases. Apply sparingly only to make threads of pipe joints.
6. Install drip leg at inlet of gas connection to boiler. Where local utility requires, extend drip leg to floor.
7. Install ground joint union when required for servicing. See Figure 22.
8. Install manual shut-off valve outside boiler jacket as shown in Figure 22 when required by local codes.
9. Support piping by hangers, not by boiler or its accessories.
10. In Canada only, the manual main shut off valve (when used) must be identified by the installer.
11. Purge all air from piping.
12. Before placing boiler in operation, check boiler and its gas connection for leaks.

WARNING Do not check for gas leaks with an open flame - use bubble test. Failure to do so can cause severe personal injury, death or substantial property damage.

   a) Close manual main shut-off valve during any pressure testing at less than 13 inches water column.
   b) Disconnect boiler and gas valve from gas supply piping during any pressure test greater than 13 inches water column.

Figure 22 Gas supply piping



Wiring

Refer to control supplement for additional information

WARNING For your safety, turn off electrical power supply before making any electrical connections to avoid possible electrical shock hazard.

All wiring must be installed in accordance with requirements of National Electrical Code and any additional national, state or local code requirements having jurisdiction. ALL wiring must be N.E.C. Class 1. Boiler must be electrically grounded in accordance with National Electrical Code, ANSI/NFPA No. 70-latest edition.

In Canada, installation must conform to CSA C22.1 Canadian Electrical Code Part 1 and any local codes.

If original rollout thermal fuse element wire as supplied with boiler must be replaced, type 200°C wire or equivalent must be used. If other original wiring as supplied with boiler must be replaced, type 105°C wire or equivalent must be used.

Installer must attach wiring diagram inside jacket door.

A separate electrical circuit with a fused disconnect switch (15 amp. recommended) should be used for the boiler.

A strain relief bushing and adapter must be used at each point where wiring passes through control case (see Figure 23) to protect wiring insulation.

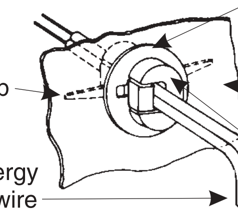
Refer to zone valve manufacturer's literature for wiring and application. A separate transformer is required to power zone valves. Zoning with circulators requires a relay for each circuit.

Install room thermostat

Install room thermostat on an inside wall. Never install where it will be influenced by drafts, hot or cold water pipes, lighting fixtures, television, rays of the sun or near a fireplace.

Refer to Control Supplement or correct wiring diagram for recommended heat anticipator setting with Standard equipment. Wire thermostat as shown.

Figure 23 Wiring multiple zones



Final adjustments

Water treatment

DANGER Do not use petroleum-based cleaning or sealing compounds in boiler system. Severe boiler damage will occur.

Continual fresh make-up water will reduce boiler life. Minerals can build up in sections, reducing heat transfer, overheating cast iron, and causing section failure.

In hard water areas or low pH conditions (less than 7.0) consult local water treatment company.

Freeze protection (when used):

Use antifreeze especially made for hydronic systems. Inhibited propylene glycol is recommended.

WARNING Do not use automotive, ethylene glycol or undiluted antifreeze. Severe personal injury, death or substantial property damage can result.

50% solution provides protection to about -30°F.

Local codes may require back-flow preventer or actual disconnect from city water supply.

Determine quantity according to system water content. Boiler water content is listed on page 27. Remember to add in expansion tank water content.

Follow antifreeze manufacturer's instructions.

Filling water systems

1. Close manual air vents, drain cock, and automatic air vent, if used.
2. Fill to correct system pressure. Correct pressure will vary with each application. Residential systems are often designed for 12 pounds of cold fill pressure.
3. Open automatic air vent one turn, if used.
4. Open manual water feed valve.
   a) Starting on lowest floor, open air vents one at a time until water squirts out. Close vent.
   b) Repeat with remaining vents.
5. Close manual water feed valve when correct boiler pressure is reached.
6. If purge valve is used - located in the return piping above isolation valve:
   a) Connect hose to purge valve.
   b) Close isolation valve. Open purge valve.
   c) Open hand water feed valve and allow system to purge all air. If system has more than one circuit, purge each circuit separately by opening each balancing valve one at a time.
   d) Close purge valve and water feed valve cock.
   e) Open isolation valve.
   f) Fill system to correct pressure.

Filling steam boilers

1. Do not fill (except for leakage tests) until boiler is ready to be fired.
2. Fill to normal waterline, halfway up gauge glass.
3. Boiler water pH 7.0 to 8.5 is recommended.
4. Follow skimming procedure.

Final adjustments *(continued)*

Skimming steam boilers

NOTICE Clean all newly installed steam boilers to remove oil and grease. Failure to properly clean can result in violent fluctuations of water level, water passing into steam mains, or high maintenance costs on strainers, traps and vents.

DANGER Do not use petroleum-based cleaning or sealing compounds in boiler system. Severe boiler damage will occur.

1. Provide 1 1/2" piping from skim tapping to floor drain.
2. Adjust water line to midpoint of skim tapping.
3. Fire boiler to maintain temperature below steaming rate.
4. Feed in water to maintain water level. Cycle burners to prevent rise in steam pressure.
5. Continue skimming until discharge is clear. May take several hours.
6. Drain boiler. While boiler is WARM, BUT NOT HOT, flush all interior surfaces under full pressure until drain water runs clear.
7. Remove skim piping. Plug tapping.
8. Close drain cock. Fill with fresh water to waterline. Start burners and steam for 15 minutes to remove dissolved gases. Stop burners.
9. Check traps and air vents for proper operation.

Inspect base insulation

WARNING The boiler contains ceramic fiber and fiberglass materials. Use care when handling these materials per instructions on page 19 of this manual. Failure to comply could result in severe personal injury.

Make sure base insulation is secure against base panels. If base insulation is damaged or displaced, do not operate boiler. Reposition or replace insulation.

To place in operation

1. Be sure boiler has been correctly filled with water.
2. Follow lighting/operating instructions on boiler.

For propane boilers only:

Your propane supplier mixes an odorant with the propane to make its presence detectable. In some instances, the odorant can fade, and the gas may no longer have an odor.

WARNING Propane gas can accumulate at floor level. Smell near the floor for the gas odorant or any unusual odor. If you suspect a leak, do not attempt to light the pilot.

- Use caution when attempting to light a propane pilot. This should be done by a qualified service technician, particularly if pilot outages are common.
- Periodically check the odorant level of your gas.
- Inspect boiler and system at least yearly to make sure all gas piping is leak-tight.
- Consult your propane supplier regarding installation of a gas leak detector. There are some products on the market intended for this purpose. Your supplier may be able to suggest an appropriate device.

3. If boiler starts, go to Step 5.
   If boiler fails to start, go to Step 4.
4. If boiler fails to start, check:
   a) Loose connection or blown fuse?
   b) Limit setting below boiler water temperature or pressure?
   c) Thermostat below room temperature?
   d) Gas not turned on at meter and boiler?
   e) Incoming natural gas pressure less than 5" W.C. or propane less than 11" W.C.?
   f) If above fails to eliminate the trouble, refer to Control Supplement.
5. Make sure boiler goes through several normal operating cycles.
6. Turn thermostat or operating control to desired setting.

Check-out procedure

Check-out procedure

Check-off steps as completed.

- ❑ System properly filled with water?
- ❑ Automatic air vent, if used, open one turn (water boilers only)?
- ❑ Air purged from system (water boilers only)?
- ❑ Steam boilers properly skimmed?
- ❑ Air purged from gas piping?. Piping checked for leaks?
- ❑ Are proper orifices installed? Check page 7 for proper size.

DANGER Proper orifices must be used. Failure to do so will cause severe personal injury, death or substantial property damage.

- ❑ Follow operating instruction label on boiler for proper start-up. Also refer to "To Place in Operation," page 17.
- ❑ Proper burner flame? Refer to "Check Main Burner Flames" and "Check Pilot Burner Flame," page 21.
- ❑ Test limit control: While burners are operating, move limit control indicator below actual boiler water temperature or pressure. Burners should go off. Circulator should continue to operate (water boilers only). Raise indicator above boiler water temperature or pressure and burners should reignite.
- ❑ Test any additional field-installed controls: If boiler has low water cut-off, additional high limit or other controls, test for operation as outlined by manufacturer. Burners should be operating and should go off when controls are tested. When controls are restored, burners should reignite.
- ❑ EG only - button on spill switch pushed in?
- ❑ To test ignition system shut-off device:

a. For boilers with electronic ignition systems: Connect manometer to outlet side of gas valve. Start boiler, allowing for normal start-up cycle to occur and main burners to ignite. With main burners on, manually shut off gas supply at manual main shutoff gas valve. Burners should go off. Open manual main shut-off gas valve. Manometer should confirm there is no gas flow. Pilot will relight, flame sensing element will sense pilot flame and main burners reignite.

b. For standing pilot - Turn gas cock knob to PILOT position and extinguish pilot flame. Pilot gas flow should stop in less than 3 minutes. Put system back into operation (see page 17).

- ❑ Limit control set to design temperature or pressure requirements of system? Maximum limit setting - 240°F (water boilers) - 15# (steam boilers).
- ❑ For multiple zones, flow adjusted so it is about the same in each zone (water boilers only)?
- ❑ Thermostat heat anticipator set properly? Refer to "Room Thermostat," page 15 and correct wiring diagram.
- ❑ Boiler cycled with the thermostat? Raise to highest setting. Boiler should go through normal start-up cycle. Lower to lowest setting. Boiler should go off.
- ❑ Measure gas input (natural gas only):

a. Operate boiler 10 minutes.

b. Turn off other appliances.

c. At the natural gas meter, measure time (in seconds) required to use one cubic foot of gas.

d. Calculate gas input:

$$\frac{3600 \times 1000}{\text{number of seconds from step } \mathbf{c}} = \text{Btuh}$$

e. Btuh calculated should approximate input rating on rating label.

- ❑ Check manifold gas pressure by connecting a manometer to the downstream test tapping on main gas valve.

  MANIFOLD GAS PRESSURE
  NAT. = 3.5" W.C.
  L.P. = 10.0" WC.

- ❑ Several operating cycles observed for proper operation? If damper is provided, see Control Supplement for check- out procedure.
- ❑ Room thermostat set to desired temperature?
- ❑ Installation and Service Certificate on this page completed?
- ❑ All instructions shipped with this boiler reviewed with owner or maintenance person, returned to envelope and given to owner or displayed near boiler?

Installation and Service Certificate

Boiler Model ________ Series ________ CP Number ________ Date Installed ________

BTU Input ________

- ❑ Installation instructions have been followed.
- ❑ Check-out sequence has been performed.
- ❑ Above information is certified to be correct.
- ❑ Information received and left with owner/maintenance person.

Installer ________

(Company) (Address) (Phone) (Installer's Signature)

Service

Handling fiberglass and ceramic fiber materials

REMOVAL OF COMBUSTION CHAMBER LINING OR BASE PANELS

WARNING

The combustion chamber lining or base insulation panels in this product contain ceramic fiber materials. Ceramic fibers can be converted to cristobalite in very high temperature applications. The International Agency for Research on Cancer (IARC) has concluded, "Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1).":

- Avoid breathing dust and contact with skin and eyes.
    - Use NIOSH certified dust respirator (N95). This type of respirator is based on the OSHA requirements for cristobalite at the time this document was written. Other types of respirators may be needed depending on the job site conditions. Current NIOSH recommendations can be found on the NIOSH web site at http://www.cdc.gov/niosh/homepage.html. NIOSH approved respirators, manufacturers, and phone numbers are also listed on this web site.
    - Wear long-sleeved, loose fitting clothing, gloves, and eye protection.
- Apply enough water to the combustion chamber lining or base insulation to prevent airborne dust.
- Remove combustion chamber lining or base insulation from the boiler and place it in a plastic bag for disposal.
- Wash potentially contaminated clothes separately from other clothing. Rinse clothes washer thoroughly.

NIOSH stated First Aid.

- Eye: Irrigate immediately
- Breathing: Fresh air.

REMOVAL OF FIBERGLASS WOOL — OR —

INSTALLATION OF FIBERGLASS WOOL, COMBUSTION CHAMBER LINING OR BASE PANELS:

WARNING

This product contains fiberglass jacket insulation and ceramic fiber materials in combustion chamber lining or base panels in gas fired products. Airborne fibers from these materials have been listed by the State of California as a possible cause of cancer through inhalation.

- Avoid breathing dust and contact with skin and eyes.
    - Use NIOSH certified dust respirator (N95). This type of respirator is based on the OSHA requirements for fiberglass wool at the time this document was written. Other types of respirators may be needed depending on the job site conditions. Current NIOSH recommendations can be found on the NIOSH web site at http://www.cdc.gov/niosh/homepage.html. NIOSH approved respirators, manufacturers, and phone numbers are also listed on this web site.
    - Wear long-sleeved, loose fitting clothing, gloves, and eye protection.
- Operations such as sawing, blowing, tear out, and spraying may generate airborne fiber concentration requiring additional protection.
- Wash potentially contaminated clothes separately from other clothing. Rinse clothes washer thoroughly.

NIOSH stated First Aid.

- Eye: Irrigate immediately
- Breathing: Fresh air.

Service *(continued)*

WARNING Also Refer to Additional Instructions Shipped With The Boiler For Specific Control Operation and Troubleshooting. Verify Proper Operation After Servicing

NOTICE Your boiler should be inspected, cleaned and, if necessary, adjusted once a year. A qualified service agency should be called.

WARNING To avoid personal injury, before servicing:

1. Disconnect electrical supply.
2. Shut-off gas supply.
3. Allow boiler to cool.

WARNING Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation.

WARNING To avoid personal injury, death or property damage, keep boiler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.

Do not block flow of air to boiler. Incomplete combustion and flue gas spillage can occur.

Do not store sources of hydrocarbons (i.e., bleaches, cleaners, chemicals, sprays, paint removers, fabric softeners, etc.) in boiler area. This can contribute to shortened boiler/vent system life.

Suggested minimum service schedule for qualified service technician only

Beginning of each heating season:

1. Annual service call by a qualified service agency.
2. Check burners and flueways and clean if necessary. Reference “Clean Boiler Heating Surfaces” and “Cleaning Main Burners,” page 21.
3. Visually inspect base insulation. Reference “Inspect Base Insulation,” page 17.
4. Follow procedure “To Place in Operation,” page 17.
5. Visually inspect pilot and burner flames. Reference “Check Main Burner Flames” and “Check Pilot Burner Flame,” page 21.
6. Visually inspect venting system for blockage, deterioration or leakage. Reference “Inspect Venting System,” page 21.
7. Check operation of low-water cut-off, if used, and additional field-installed controls. Refer to manufacturer’s instructions
8. Check that boiler area is free from combustible materials, gasoline and other flammable vapors and liquids.
9. Check for and remove any obstruction to flow of combustion or ventilation air.
10. Follow instructions on circulator to oil, if oil lubricated. Over-oiling will damage the circulator. Water lubricated circulators do not need oiling.

Daily during heating season:

1. Check that boiler area is free from combustible materials, gasoline and other flammable vapors and liquids.
2. Check for and remove any obstruction to flow of combustion or ventilation air.

Periodically during heating season:

1. Check relief valve. Reference manufacturer’s instructions on relief valve tag.
2. Test low water cut-off, if used. Blowdown if low water cut-off is float type. Reference manufacturer’s instructions.

Monthly during heating season:

1. Check for leaks in boiler and piping. If found, repair at once.

DANGER Continuous use of make-up water can damage boiler sections due to addition of minerals. Do not use petroleum based stop- leak compounds - leakage between the sections will occur.

2. Check any gaskets for leakage. Tighten or replace, if needed. Do not overtighten bolts - gasket damage can occur.
3. Visually inspect pilot and burner flames. Reference “Check Main Burner Flames” and “Check Pilot Burner Flame,” page 21.
4. Visually inspect venting system for blockage, deterioration or leakage. Reference “Inspect Venting System,” page 21.
5. Check automatic air vent for leakage. If leaking, remove vent cap and push valve core in to wash off sediment that may have accumulated oft the valve seat. Release valve, replace cap and open one turn.

End of each heating season:

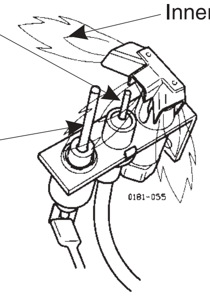
1. Follow “Annual Shutdown Procedure,” page 21.

Service *(continued)*

Check pilot burner flames

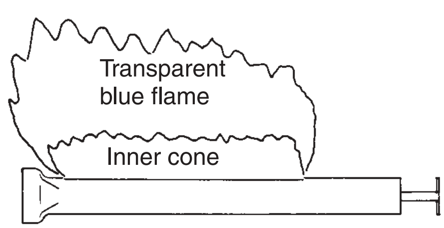
1. Proper pilot flame
   a) Blue flame.
   b) Inner cone engulfing pilot flame sensor.
   c) Pilot flame sensor glows cherry red.

Figure 24 Typical pilot burner flame



2. Improper pilot flame.
   a) Overfired - flames large and lifting or blowing past pilot flame sensor.
   b) Underfired - flame small; pilot flame sensor not engulfed by inner cone.
   c) Lack of primary air - flame tip yellow.
   d) Pilot flame sensor not heated properly.

Figure 25 Typical main burner flame



Check main burner flames

1. Proper burner flame - Yellow-orange streaks may appear - caused by dust.
2. Improper flame:
   a) Overfired - Flames large.
   b) Underfired - Flames small.
   c) Lack of primary air - Yellow tipping on flames; sooting will occur.

Inspect venting system

1. Check venting system at least once a month during heating season. With boiler firing, hold candle or match below lower edge of draft hood "skirt". If flame does not blow out, but burns undisturbed, vent system is functioning properly. If flame blows out or flickers drastically, vent system must be checked for obstructions or other causes of improper venting.
2. Inspect all parts of venting systems for deterioration from corrosion, physical damage, sagging, etc. Correct all conditions found.
3. Verify damper is open when burner ignites. For additional information, see Control Supplement.

Clean boiler heating surfaces

WARNING The boiler contains ceramic fiber and fiberglass materials. Use care when handling these materials per instructions on page 19 of this manual. Failure to comply could result in severe personal injury.

1. Follow shut-down procedure
2. Disconnect breeching and remove damper (if used) and draft hood.
3. Remove upper rear jacket panel. Turn back jacket insulation to expose collector hood.
4. Remove collector hood. Clean excess boiler cement from collector hood and cast iron sections.
5. Remove burners from base of boiler. Follow "Cleaning main burners" to thoroughly clean burners. Place newspaper in base of boiler to collect soot that will fall.
6. With a wire flue brush, clean between the sections.
7. Remove paper and soot. Vacuum or brush base and surrounding area.
8. Replace collector hood. Seal with boiler cement.
9. Replace draft hood, damper (if used) and breeching.
10. Replace insulation and jacket panel.
11. Replace main burners.

DANGER When replacing, burner tubes must be seated in slots in back burner support with openings face up. Gas orifices must inject down center of burner. Failure to properly seat burners will result in severe personal injury, death or substantial property damage.

12. Follow "To Place in Operation" procedure.

NOTE: Excessive sooting indicates improper gas combustion. Call a qualified service agency or your local gas utility to check for proper combustion and make any necessary adjustments.

Cleaning main burners

1. Vacuum or brush burners to remove dust and lint.

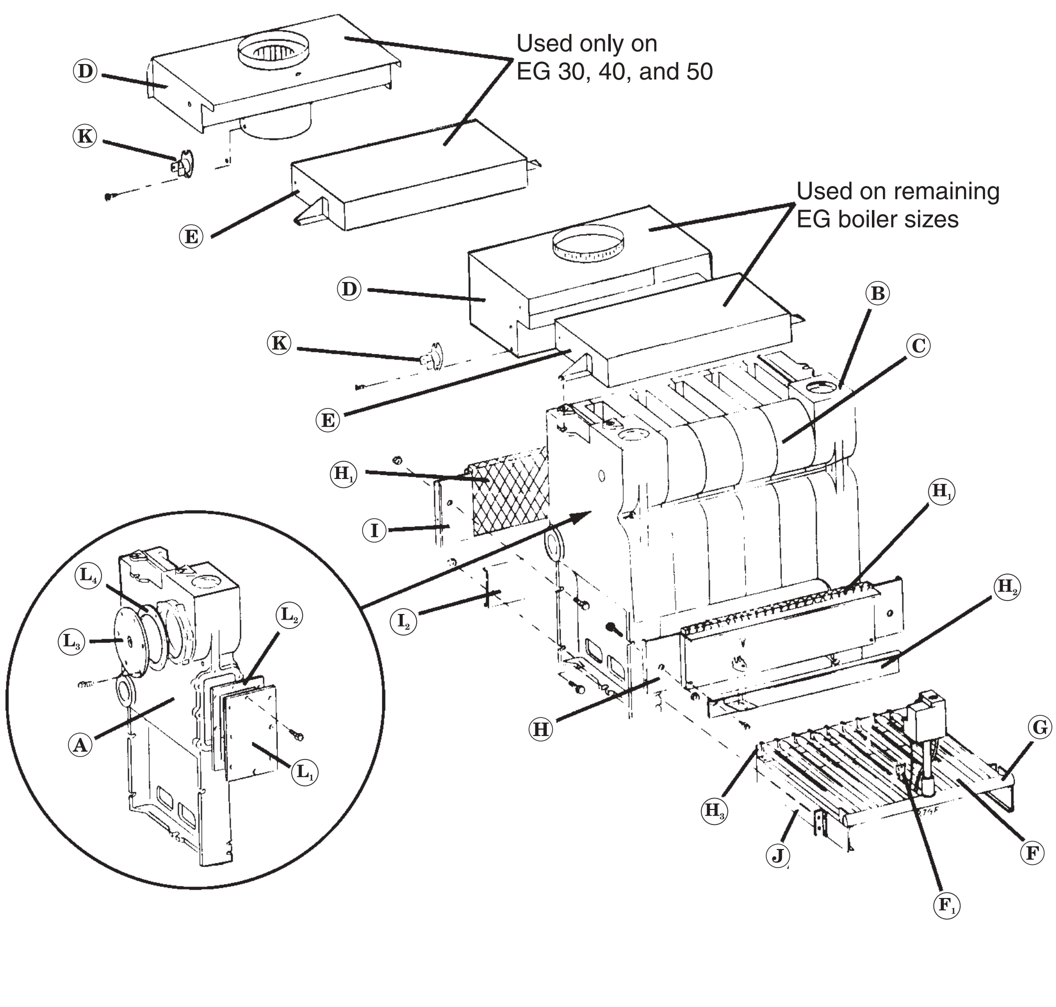
DANGER When replacing, burner tubes must be seated in slots in the back with openings face up. Gas orifices must inject down center of burner. Failure to properly seat burners will result in severe personal injury, death or substantial property damage.

Annual shut-down procedure

1. Follow correct lighting/operating instructions on boiler.
2. Do not drain system unless exposure to freezing temperatures will occur. If antifreeze is used with system, do not drain.
3. If complete boiler and piping system must be drained to avoid freezing, provide method to drain water from both ends of boiler at or below return tapping level.

Replacement parts – EG

WARNING The boiler contains ceramic fiber and fiberglass materials. Use care when handling these materials per instructions on **page 19** of this manual. Failure to comply could result in severe personal injury.



Replacement parts – EG *(continued)*

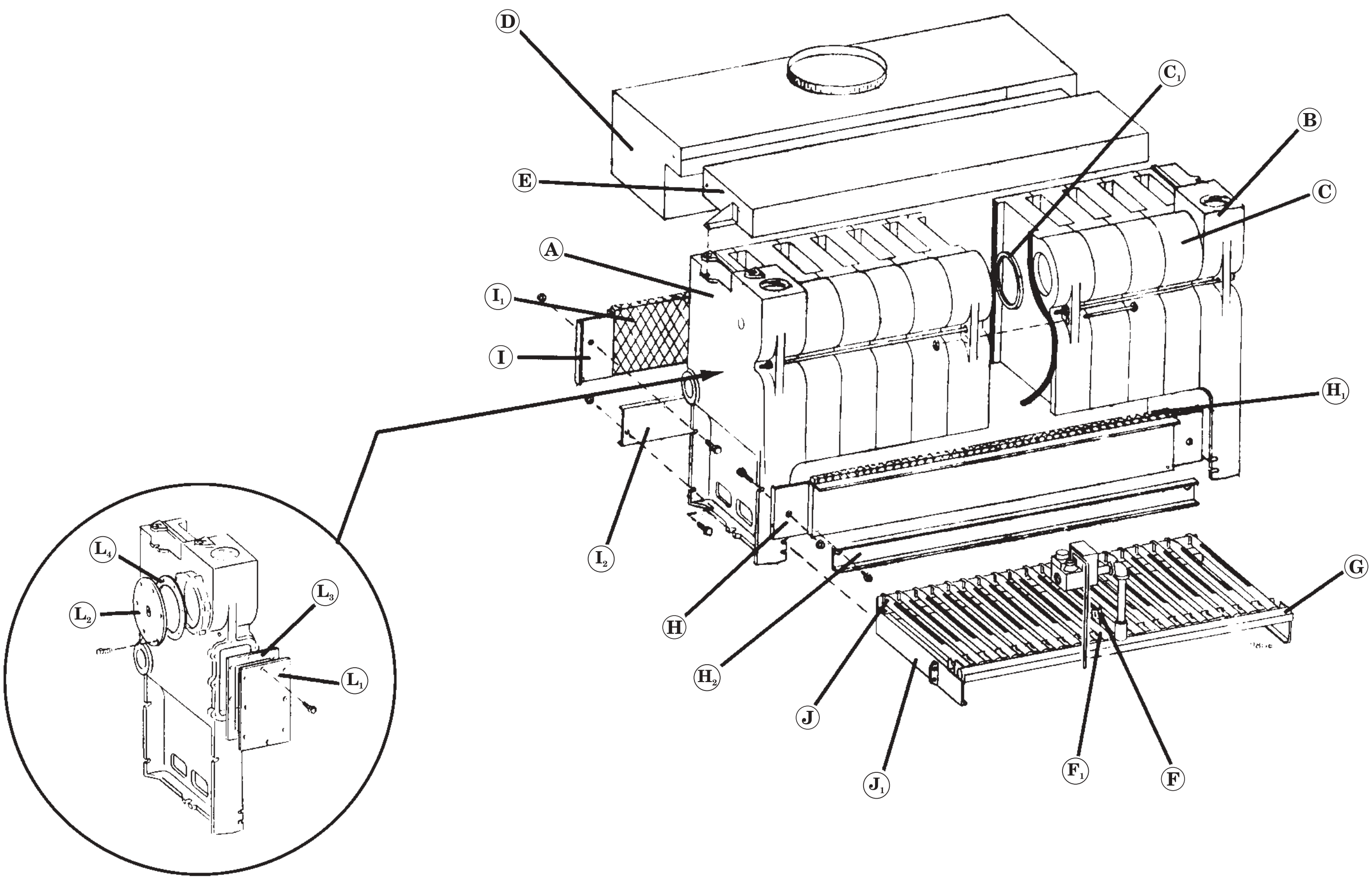
Item	Description	Boiler Models	Part Number
A	Left hand end section with heater opening (Pattern No. 1814)	—	311-800-014
	Left end section without heater opening(Pattern No. 1813)	—	311-800-007
B	Right hand end section without heater opening (Pattern No. 18118)	—	311-800-029
C	Intermediate section (Pattern No. 1815)	—	311-800-010
D	Draft hood	EG-30	450-021-255
		EG-35	450-021-256
		EG-40	450-021-257
		EG-45	450-021-258
		EG-50	450-021-259
		EG-55	450-021-260
		EG-65	450-021-261
		EG-75	450-021-262
E	Collector hood	EG-30, 35	450-014-733
		EG-40, 45	450-014-734
		EG-50, 55	450-014-735
		EG-65	450-014-736
		EG-75	450-014-737
F	Burner, steel tube, regular stainless	—	512-200-000
F_1	Burner, steel tube, with pilot bracket "PI" system (ALL) "SPN" system (EG-75) "SPL" system (ALL)	—	512-200-001
	Burner, steel tube, with pilot bracket "SPN" system (EG-30 & -65 Only)	—	512-200-002
G	Manifold	EG-30	591-125-533
		EG-35	591-125-538
		EG-40	591-125-534
		EG-45	591-125-539
		EG-50	591-125-535
		EG-55	591-125-540
		EG-65	591-125-541
		EG-75	591-125-542
	Section assembly, complete with heater opening (not shown)	EG-30, 35	321-811-095
	Section assembly, complete without heater opening (not shown)	EG-35	321-811-100
	Section assembly, complete with heater opening (not shown)	EG-40, 45	321-811-110
	Section assembly, complete without heater opening (not shown)	EG-40, 45	321-811-115
	Section assembly, complete with heater opening (not shown)	EG-50, 55	321-811-120
	Section assembly, complete without heater opening (not shown)	EG-50, 55	321-811-125
	Section assembly, complete with heater opening (not shown)	EG-65	321-811-130
	Section assembly, complete without heater opening (not shown)	EG-65	321-811-135
	Section assembly, complete with heater opening (not shown)	EG-75	321-811-140
	Section assembly, complete without heater opening (not shown)	EG-75	321-811-145
	Retort cement (1 quart) (not shown)	—	591-602-913
	Flue brush, 124 DMG (not shown)	—	591-706-214
	Main burner orifice, natural gas, 2.45mm (note 1) (not shown)	—	560-528-987
	Main burner orifice, propane gas, 1.55mm (note 1) (not shown)	—	560-528-988

Item	Description	Boiler Models	Part Number
H	Front base panel	EG-30, 35	451-800-000
		EG-40, 45	450-800-001
		EG-50, 55	451-800-002
		EG-65	451-800-003
		EG-75	451-800-004
H_1	Base insulation kit (includes front and rear base panel insulation, water glass, and boiler cement)	—	510-811-660
H_2	Base front access panel with flame rollout switch bracket	EG-30, 35	451-800-040
		EG-40, 45	451-800-041
		EG-50	451-800-039
		EG-55	451-800-042
		EG-65	451-800-043
		EG-75	451-800-044
H_3	Back burner support	EG-30	451-800-085
		EG-35	451-800-086
		EG-40	451-800-087
		EG-45	451-800-088
		EG-50	451-800-089
		EG-55	451-800-090
		EG-65	451-800-092
		EG-75	451-800-094
I	Back base panel	EG-30, 35	451-800-010
		EG-40, 45	451-800-011
		EG-50, 55	451-800-012
		EG-65	451-800-013
		EG-75	451-800-014
I_2	Base back channel	EG-30, 35	451-800-020
		EG-40, 45	451-800-021
		EG-50, 55	451-800-022
		EG-65	451-800-023
		EG-75	451-800-024
J	Base side rail (2 required)	—	451-800-070
K	Spill switch	—	510-350-105
L	Cover plate for heater opening (rectangular)	—	389-900-103
L_2	Gasket for cover plate (rectangular)	—	590-317-579
L_3	Cover plate for heater opening (round)	—	389-900-101
L_4	Gasket for cover plate (round)	—	590-317-495
	Section replacement kit (includes 3" and 6" elastomer seal, 4 ft. cope seal; order 1 per joint between sections) (not shown)	—	311-800-667
	3" diameter bottom elastomer seal (1 per joint) (not shown)	—	592-800-010
	6" diameter top elastomer seal (1 per joint) (not shown)	—	592-800-007
	Sealer for sections (cope seal – 4 ft. per joint) (not shown)	—	591-641-865
	½" Tie rod without nut (2 per boiler) (not shown)	EG-30, 35	560-234-470
	½" Tie rod without nut (2 per boiler) (not shown)	EG-40, 45	560-234-475
	½" Tie rod without nut (2 per boiler) (not shown)	EG-50, 55	560-234-480
	½" Tie rod without nut (2 per boiler) (not shown)	EG-65	560-234-485
	½" Tie rod without nut (2 per boiler) (not shown)	EG-75	560-234-490
	½" Nut (2 per tie rod) (not shown)	—	561-928-221
	½" Lock washer (1 per tie rod) (not shown)	—	562-248-668

NOTE 1: Order sufficient quantities to replace all orifices within a base

Replacement parts – EGH

WARNING The boiler contains ceramic fiber and fiberglass materials. Use care when handling these materials per instructions on **page 19** of this manual. Failure to comply could result in severe personal injury.



Replacement parts – EGH *(continued)*

Item	Description	Boiler Models	Part Number
A	Left hand end section with heater opening (Pattern No. 1814)	—	311-800-014
	Left hand end section without heater opening (Pattern No. 1813)	—	311-800-007
B	Right hand end section with heater opening (Pattern No. 1819)	—	311-800-022
	Right hand end section without heater opening with control tappings (Pattern No. 18118)	—	311-800-032
C	Intermediate section (Pattern No. 1815)	—	311-800-010
	Intermediate section with tie rod lugs (Pattern No. 1817)	—	311-800-026
C_1	3” Diameter bottom elastomer seal (1 per joint)	—	592-800-010
	6” Diameter top elastomer seal (1 per joint)	—	592-800-007
D	Draft hood	EGH-85	450-206-240
		EGH-95	450-206-241
		EGH-105	450-206-242
		EGH-115	450-206-243
		EGH-125	450-206-244
E	Collector hood	EGH-85	450-014-750
		EGH-95	450-014-751
		EGH-105	450-014-752
		EGH-115	450-014-753
		EGH-125	450-014-754
F	Burner, stainless tube, regular	—	512-200-000
F_1	Burner, stainless tube, with pilot bracket	—	512-200-001
G	Manifold	EGH-85	591-125-543
		EGH-95	591-125-544
		EGH-105	591-125-545
		EGH-115	591-125-546
		EGH-125	591-125-547
H	Front base panel (in base panel carton)	—	—
H1	Front base insulation (in base panel carton)	—	—
H_2	Base front access panel (in base panel carton)	—	—
H, H_1, H_2, I, I_1 & I_2	Base panel carton	EGH-85	381-700-240
		EGH-95	381-700-245
		EGH-105	381-700-250
		EGH-115	381-700-255
		EGH-125	381-700-260
I	Back base panel (in base panel carton)	—	—
I_1	Back base insulation (in base panel carton)	—	—
I_2	Back base channel (in base panel carton)	—	—
J	Side rail for burner pane with bracket for burner pan	—	451-800-070
J_1	Back burner support	EGH-85	450-800-095
		EGH-95	451-800-096
		EGH-105	451-800-097
		EGH-115	451-800-098
		EGH-125	451-800-099

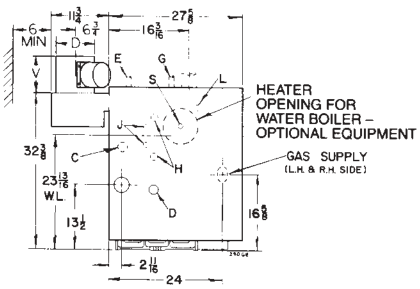
Item	Description	Boiler Models	Part Number
L_1	Cover plate for heater opening (rectangular)	—	389-900-103
L_2	Gasket for cover plate (rectangular)	—	590-317-579
L_3	Cover plate for heater opening (round)	—	389-900-101
L_4	Gasket for cover plate (round)	—	590-317-495
	Section assembly, complete with heater opening (not shown)	EGH-85	321-711-100
	Section assembly, complete without heater opening (not shown)	EGH-85	321-711-105
	Section assembly, complete with heater opening (not shown)	EGH-95	321-711-110
	Section assembly, complete without heater opening (not shown)	EGH-95	321-711-115
	Section assembly, complete with heater opening (not shown)	EGH-105	321-711-120
	Section assembly, complete without heater opening (not shown)	EGH-105	321-711-125
	Section assembly, complete with heater opening (not shown)	EGH-115	321-711-130
	Section assembly, complete without heater opening (not shown)	EGH-115	321-711-135
	Section assembly, complete with heater opening (not shown)	EGH-125	321-711-140
	Section assembly, complete without heater opening (not shown)	EGH-125	321-711-145
	Section replacement kit (includes 3” and 6” elastomer seal, 4 ft. cope seal; order 1 per joint between sections) (not shown)	—	381-800-667
	Burner shields (rollout)	EGH-85	451-800-120
		EGH-95	451-800-121
		EGH-105	451-800-122
		EGH-115	451-800-123
		EGH-125	451-800-124
	Main burner orifice, natural gas, 2.45mm (note 2)	—	560-528-987
	Main burner orifice, propane gas, 1.55mm (note 2)	—	560-528-988
	Sealer for sections (cope seal – 4 ft. per joint)	—	591-641-865
	½” x 7” Tie rod w/o nut (2 per boiler) (not shown)	—	560-234-465
	½” x 17” Tie rod w/ nut (not shown) (4 – EGH-85) (2 – EGH-95)	—	560-234-472
	½” x 21¼” Tie rod w/o nut (not shown) (2 – EGH-95) (2 – EGH-115) (4 – EGH-125)	—	560-234-477
	½” x 25¼” Tie rod w/o nut (not shown) (2 – EGH-115) (4 – EGH-125)	—	560-234-482
	½” Nut (2 per tie rod)	—	561-928-221
	½” Lock washer (1 per tie rod)	—	562-248-668
	Retort cement (1 quart)	—	591-602-913
	Flue brush, 124 DMG	—	591-706-214

NOTE 1: Order sufficient quantities to replace all orifices within a base

Data

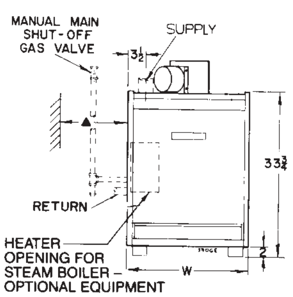
Boiler number	Supply EG/EGH	Return EG/EGH	Dimensions			Gas conection size - natural propane	Draft hood outlet size	Dimensions of P-EG crate Outside measurements in Inches			Approx. shipping weight
			D	W	V	(note 1)		Length	Width	Height	(lbs.)
EG & P-EG-30 & -35	1 - 3”	1 - 2½”	5”	17”	6”	½”	5”	35”	30”	39”	430
EG & P-EG-40 & -45	1 - 3”	1 - 2½”	6”	21¼”	6½”	½”	6”	35”	30”	39”	505
EG & P-EG-50 & -55	1 - 3”	1 - 2½”	7”	25½”	9	½”	7”	35”	30”	39”	585
EG-65	1 - 3”	1 - 2½”	8”	29¾”	9½”	¾”	8”	–	–	–	660
EG-75	1 - 3”	1 - 2½”	8”	34”	–	¾”	8”	–	–	–	735
EGH-85	2 - 3”	2 - 2½”	9”	38¼”	–	¾”	9”	–	–	–	825
EGH-95	2 - 3”	2 - 2½”	10”	42½”	–	¾”	10”	–	–	–	915
EGH-105	2 - 3”	2 - 2½”	10”	46¾”	–	1”	10”	–	–	–	1005
EGH-115	2 - 3”	2 - 2½”	12”	51”	–	1”	12”	–	–	–	1095
EGH-125	2 - 3”	2 - 2½”	12”	55¼”	–	1”	12”	–	–	–	1185
Note:	1. Sizes shown are gas connection sizes. Gas piping from meter to boiler to be sized according to local utility requirements. 2. Damper dimension for EG-30 and EG-65 ONLY. EG-75 and EGH damper are additional equipment.										

Dimensions EG



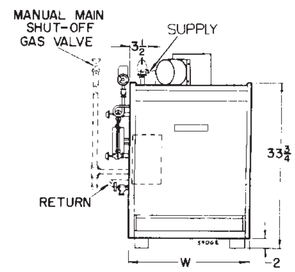
LEFT SIDE

▲ Heater clearance:
E-624-14″
E-626-19″
E-632-22″

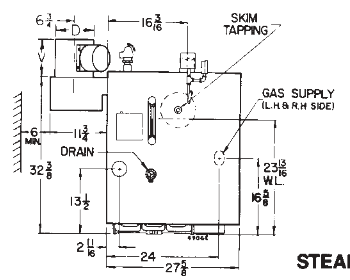


FRONT

Dimensions P-EG

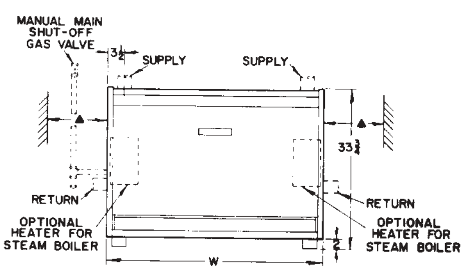


STEAM – FRONT

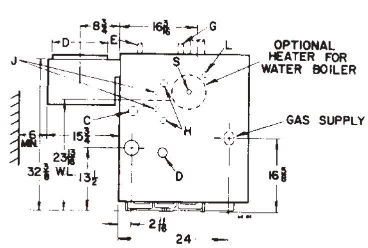


STEAM – LEFT SIDE

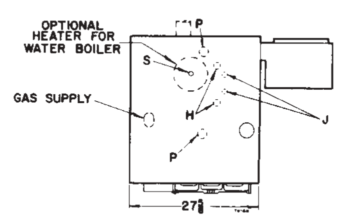
Dimensions EGH



FRONT



LEFT SIDE



RIGHT SIDE

Ratings

DOE

Boiler model number	0–2,000 feet altitude		2,000–4,500 feet altitude (Canada)		Net I=B=R ratings			Chimney size	Boiler water content (gallons)	
	Input (Btuh)	DOE Heating Capacity (Output) (Btuh)	Input (Btuh)	Output (Btuh)	Sq. Ft. Steam	Steam Btuh	Water Btuh		Water	Steam (to waterline)
(Notes 1 & 2)		(Note 3)	(Note 4)		(Note 5)					
***EG-30-**	75,000	62,000	67,500	56,000	196	47,000	55,000	5"I.D. x 20'	12.3	8.4
***EG-35-**	100,000	83,000	90,000	75,000	258	62,000	73,000	5"I.D. x 20'	12.3	8.4
***EG-40-**	125,000	104,000	112,500	93,000	325	78,000	91,000	6"I.D. x 20'	14.8	9.8
***EG-45-**	150,000	125,000	135,000	112,000	392	94,000	110,000	6"I.D. x 20'	14.8	9.8
***EG-50-**	175,000	145,000	157,500	131,000	454	109,000	128,000	7"I.D. x 20'	17.3	11.2
***EG-55-**	200,000	167,000	180,000	150,000	521	125,000	146,000	7"I.D. x 20'	17.3	11.2
EG-65-	250,000	209,000	225,000	188,000	654	157,000	183,000	8"I.D. x 20'	19.8	12.6
EG-75-	300,000	240,000	270,000	216,000	750	180,000	209,000	8"I.D. x 20'	22.3	14.0
EGH-85-	349,900	280,000	315,000	252,000	875	210,000	243,000	9"I.D. x 20'	24.8	15.4
EGH-95-	400,000	320,000	360,000	288,000	1,000	240,000	278,000	10"I.D. x 20'	27.3	16.8
EGH-105-	450,000	360,000	--	--	1,125	270,000	313,000	10"I.D. x 20'	29.8	18.2
EGH-115-	500,000	400,000	--	--	1,250	300,000	348,000	12"I.D. x 20'	32.3	19.6
EGH-125-	550,000	440,000	--	--	1,375	330,000	383,000	12"I.D. x 20'	34.8	21.0

Notes:

* Add prefix "P" for package boiler completely assembled and wired with jacket and controls (PEG-30-S through PEG-55-S only).

1. **EG-30 thru 75**: Add suffix "SPD" or "SP" for standing pilot; add "PID" or "PI" for electronic ignition (30-65 — damper required in U.S.; optional in Canada); add "N" for natural; add "L" for propane; add "W" for water; add "S" for steam; add "T" for tankless heater; add "P" for provisional tankless heater.

   EGH-85 & 95: Add suffix"SP" for standing pilot; add "PI" for electronic ignition (damper available on PI only); add "N" for natural; add "L" for propane; add "W" for water; add "S" for steam; add "T" for tankless heater (tankless available on EGH-85 thru 125 PI Water and Steam; EGH-85 and 95 SP Steam only); add "P" for provisional tankless heater.

   EGH-105 thru 125: Add suffix "PI" for electronic ignition (damper available on PI only); add "W" for water; add "S" for steam; add "T" for tankless heater.
2. EGH water boilers tested for 50 P.S.I working pressure.
3. Based on standard test procedures prescribed by the United States Department of Energy.

   EG-75 thru EGH-125: CSA Gross output.
4. EGH-105 thru 125 may be installed at altitudes of 2,000-4,500 feet subject to acceptance by Provincial Inspections Authority based on field tests of individual installations.
5. Net I=B=R ratings are based on net installed radiation of sufficient quantity for the requirements of the building and nothing need be added for normal piping and pick-up. Water ratings are based on a piping and pick-up allowance of 1.15; steam ratings on an allowance of 1.333. An additional allowance should be made for unusual piping and pick-up loads. Consult local Weil-McLain representative.

Boiler model number	DOE seasonal efficiency (AFUE)					
	Water			Steam		
	SPDN	SPDL	PIDN	SPDN	SPDL	PIDN
EG-30	82.2	84.2	84.3	81.0	82.9	83.0
EG-35	82.0	83.7	83.6	81.3	82.5	82.9
EG-40	82.5	84.3	84.0	81.5	83.2	82.9
EG-45	82.4	84.0	83.5	81.6	83.0	82.9
EG-50	82.9	84.4	83.8	81.9	83.7	82.8
EG-55	82.5	84.2	83.8	81.9	83.5	82.8
EG-65	82.6	84.0	84.0	82.0	82.8	83.0

Standard equipment

Factory-Assembled Section Block
Insulated Extended Jacket
Draft Hood
Aluminized Steel Burners
Non-Linting Pilot Burner
Heater Cover Plates (for boilers with tankless heater openings)
Control Wire
Electrical Junction Box

EG boilers add:

Combination Gas Valve for 24 volt
Thermocouple (high efficiency models)
Rollout Thermal Fuse Element
Spill Switch
Highest Efficiency Models, PID Intermittent Electronic Ignition System and Automatic Vent Damper
High Efficiency Models, SPD Constant Burning, Thermally Supervised Pilot System and Automatic Vent Damper

For EG water boilers

Built-In Air Eliminator
30 P.S.I. Relief Valve
Combination Pressure Temperature Gauge
High-Limit Control
40 VA Transformer with Receptacle for Circulator Relay
Circulator Relay

For EG steam boilers

Relief Valve
Steam Pressure Gauge
High-Limit Pressure Control
Syphon
Gauge Cocks
Gauge Glass
Low-Water Cutoff
40 VA Transformer

EG additional equipment

Tankless Water Heater – EG-35-65 PI and SP EG-75 PI only
With tankless heater: Combination High Limit, Low Limit, Circulator Control, and Relay with 40 VA Transformer
Tankless Steam Heater - EG35-75
With Tankless Heater:
Operating Control Tankless Heater 35-S-29 for All Units

EGH boilers add:

Combination Gas Control Valve (includes main gas valve with redundant seat, PI and PI with damper models; main gas valve with single seat, 24V models; pressure regulator, gas cock, pilot filter, pilot adjustment)
Highest Efficiency Models, PI Intermittent Electronic Ignition System
High Efficiency Models, SP Constant Burning, Thermally Supervised Pilot System, Thermocouple
100% Shutoff
40 VA Transformer with Receptacle for Circulator Relay

For EGH water boilers

Built-in Air Eliminator
30 P.S.I. Relief Valve
Combination Pressure-Temperature Gauge
High-Limit Control for PI and PI with Damper Models
Dual-Limit Control for Standard Efficiency Models
Circulator Relay

For EGH steam boilers

Relief Valve
Steam Pressure Gauge
High-Limit Pressure Control (two limit controls on EGH-85 and 95 SP)
Syphon
Gauge Cocks
Gauge Glass
Low-Water Cutoff – Probe Type

EGH additional equipment

Tankless Heaters – PI Water or Steam, SP Steam only
With Tankless Heater(s):
Operating Control
Automatic Vent Damper

WEIL-McLAIN

Weil-McLain
500 Blaine Street
Michigan City, IN 46360-2388
http://www.weil-mclain.com

Part Number 550-110-639/0703